wherein said plurality of substantially planar laser beam components produce a composite substantially planar laser illumination beam that has substantially planar spatial distribution characteristics that extend through said field of view so that laser light reflected off an object illuminated by said composite substantially planar laser illumination beam is focused along said field of view and onto said image detecting array to form an image of said illuminated object; and

wherein said composite substantially planar laser illumination beam has substantially uniform power density characteristics over the spatial extent of said composite substantially planar laser illumination beam and thus over the working range of said system into which said PLIIM is integrated.

Claim 264 (currently amended): A PLIIM-based semiconductor chip for integration into a system having a working range, said PLIIM-based semiconductor chip comprising:

a pair of linear SEL arrays for producing a ~~composite~~ a plurality of substantially planar laser illumination beam components;

a linear ~~ELECTRONIC~~ electronic image detection array having field of view (FOV) arranged in a coplanar relationship with said composite planar laser illumination beam,

wherein said linear ~~ELECTRONIC~~ electronic image detection array and said pair of linear SEL arrays are each formed on a common semiconductor substrate so that said linear ~~ELECTRONIC~~ electronic image detection array is arranged between said pair of linear SEL arrays; and

an integrated circuit package encasing said linear ~~ELECTRONIC~~ electronic image detection array and said pair of linear SEL arrays, said integrated circuit package having

electrical connector pins for connected to a host system,

first and second elongated light transmission windows disposed over said pair of linear SEL arrays so that said composite planar laser illumination beam , and

a third light transmission window disposed over said linear ~~ELECTRONIC~~ electronic image detection array;

wherein said plurality of substantially planar laser beam components are projected through said first and second elongated light transmission windows and produce a composite substantially planar laser illumination beam that has substantially planar spatial distribution

characteristics that extend through said field of view projected through said third light transmission window, so that laser light reflected off an object illuminated by said composite substantially planar laser illumination beam is focused along said field of view and onto said image detecting array to form an image of said illuminated object; and

wherein said composite substantially planar laser illumination beam has substantially uniform power density characteristics over the spatial extent of said composite substantially planar laser illumination beam and thus over the working range of said system.

Claim 265 (currently amended): A micro-imaging device for integration into a system having a working range, said PLIIM-based semiconductor chip, said micro-imaging device comprising:

a PLIIM-based semiconductor chip mounted on a mechanically oscillating scanning element in order to sweep both the FOV of a linear image detection array and coplanar planar laser illumination beam (PLIB) through a 3-D volume of space in which objects bearing bar code and other machine-readable indicia may pass;

wherein said PLIIM-based semiconductor chip includes a pair of micro-sized diffractive or refractive cylindrical lens arrays mounted upon a pair of linear arrays of surface emitting lasers (SELs) for producing a plurality of substantially planar laser beam components;

wherein said pair of linear arrays are fabricated on opposite sides of a linear electronic image detection array provided with optics having a field of view (FOV);

wherein said plurality of substantially planar laser beam components produce a composite substantially planar laser illumination beam that has substantially planar spatial distribution characteristics that extend through said field of view so that laser light reflected off an object illuminated by said composite substantially planar laser illumination beam is focused along said field of view and onto said image detecting array to form an image of said illuminated object; and

wherein said composite substantially planar laser illumination beam has substantially uniform power density characteristics over the spatial extent of said composite substantially planar laser illumination beam and thus over the working range of said system into which said micro-imaging device is integrated.

Claim 266 (currently amended): A PLIIM-based semiconductor chip comprising:

a plurality of linear SEL arrays which are electronically-activated to electro-optically scan (i.e. illuminate) the entire 3-D FOV of a ~~ELECTRONIC~~ electronic image detection array without using mechanical scanning mechanisms;

wherein a plurality of micro-sized diffractive or refractive cylindrical lens arrays are mounted upon said plurality of linear SELs for producing a plurality of substantially planar laser beam components;

wherein said pair of linear arrays are fabricated on opposite sides of a linear electronic image detection array provided with optics having a field of view (FOV);

wherein said plurality of substantially planar laser beam components produce a composite substantially planar laser illumination beam that has substantially planar spatial distribution characteristics that extend through said field of view so that laser light reflected off an object illuminated by said composite substantially planar laser illumination beam is focused along said field of view and onto said image detecting array to form an image of said illuminated object; and

wherein said composite substantially planar laser illumination beam has substantially uniform power density characteristics over the spatial extent of said composite substantially planar laser illumination beam and thus over the working range of said system into which said PLIIM-based semiconductor chip is integrated.

Claim 267 (currently amended): A PLIIM-based semiconductor chip for integration into a system having a working range, said PLIIM-based semiconductor chip, comprising:

a miniature 2-D camera having a 2-D array of SEL diodes arranged about a centrally located 2-D area-type ~~ELECTRONIC~~ electronic image detection array having optics with a field of view (FOC), said 2-D array of SEL diodes and 2-D area-type ~~ELECTRONIC~~ electronic image detection array are both mounted on a semiconductor substrate,

a micro-sized cylindrical lens arrays mounted upon said 2-D array of SEL diodes, for producing a plurality of substantially planar laser illumination beams;

a IC package for encapsulating said 2-D array of SEL diodes and said 2-D area-type ~~ELECTRONIC~~ electronic image detection array, and having

a centrally-located light transmission window positioned over said 2-D area-type ~~ELECTRONIC~~ electronic image detection array, and

a peripheral light transmission window positioned over said micro-sized cylindrical lens arrays and said 2-D array of SEL diodes ~~surrounding said centrally-located 2-D area-type ELECTRONIC image detection array;~~

wherein said plurality of substantially planar laser beam components are projected through said peripheral light transmission window and produce a composite substantially planar laser illumination beam that has substantially planar spatial distribution characteristics that extend through said field of view projected through said centrally-located light transmission window, so that laser light reflected off an object illuminated by said composite substantially planar laser illumination beam is focused along said field of view and onto said 2-D area-type electronic image detection array to form an image of said illuminated object; and

wherein said composite substantially planar laser illumination beam has substantially uniform power density characteristics over the spatial extent of said composite substantially planar laser illumination beam and thus over the working range of said system.

Claim 268 (currently amended): The PLIIM-based semiconductor chip of claim 267, wherein a light focusing lens element is aligned with and mounted over said centrally-located light transmission window to define a 3-D field of view (FOV) for forming images on said 2-D area-type ~~ELECTRONIC~~ electronic image detection array, whereas a 2-D array of cylindrical lens elements is aligned with and mounted over said peripheral light transmission window to substantially planarize laser emissions from said linear SEL arrays (comprising the 2-D SEL array) during operation.

Claim 269 (currently amended): The PLIIM-based semiconductor chip of claim 268, wherein each cylindrical lens element is spatially aligned with a row ~~(or column)~~ or column in said 2-D area-type ~~ELECTRONIC~~ electronic image detection array, and each linear array of SELs in said 2-D array of SEL diodes, over which a cylindrical lens element is mounted, is electrically addressable (i.e. activatable) by laser diode control and drive circuits.

Claim 270 (previously presented): The PLIIM-based semiconductor chip of claim 269, wherein said laser diode control and drive circuits are fabricated on said semiconductor substrate.

Claim 271 (currently amended) The PLIIM-based semiconductor chip of claim 269, wherein said 2-D area-type ~~ELECTRONIC~~ electronic image detection array has a 3-D field of view (FOV), and said 2-D array of SEL diodes enables the illumination of an object residing within said 3D FOV during illumination operations, and the formation of an image strip on the corresponding rows (or columns) of detector elements in said 2-D area-type ~~ELECTRONIC~~ electronic image detection array.

Claim 272. (canceled)

Claim 273 (currently amended) A planar laser illumination and imaging module (PLIIM) realized on a semiconductor chip for integration into a system having a working range, said PLIIM-based semiconductor chip, said PLIIM comprising:

a linear ~~ELECTRONIC~~ electronic image detection array having image formation optics providing a field of view (FOV);

a pair of micro-sized cylindrical lens arrays mounted upon a pair of linear arrays of surface emitting lasers (SELs) fabricated on opposite sides of said linear ~~ELECTRONIC~~ electronic image detection array, so as to produce a ~~composite~~ a plurality of substantially planar laser illumination beam (PLIB) components [which is aligned with said FOV in a coplanar manner];

said linear ~~ELECTRONIC~~ electronic image detection array and said linear SEL arrays being formed a common semiconductor substrate, and encased within an integrated circuit (IC) package having electrical connector pins for establishing interconnections with a host system; and

first and second elongated light transmission windows disposed over said pair of linear arrays of SELs; and

a third light transmission window disposed over said linear ~~ELECTRONIC~~ electronic image detection array;

wherein said plurality of substantially planar laser beam components are projected through said first and second elongated light transmission windows and produce a composite substantially planar laser illumination beam that has substantially planar spatial distribution characteristics that extend through said field of view projected through said third light

transmission window, so that laser light reflected off an object illuminated by said composite substantially planar laser illumination beam is focused along said field of view and onto said image detecting array to form an image of said illuminated object; and

wherein said composite substantially planar laser illumination beam has substantially uniform power density characteristics over the spatial extent of said composite substantially planar laser illumination beam and thus over the working range of said system.

Claim 274 (previously presented): The PLIIM-based chip of claim 273, wherein said micro-sized cylindrical lens arrays are fabricated from either diffractive or refractive optical material.

Claim 275 (currently amended): The PLIIM of claim 273, wherein said pair of linear arrays of SELs and said linear ~~ELECTRONIC~~ electronic image detection array are arranged in optical isolation of each other to avoid light leaking onto said linear ~~ELECTRONIC~~ electronic image detector from within said IC package.

Claim 276 (previously presented): The PLIIM-based chip of claim 273, mounted on a mechanically oscillating scanning element in order to sweep both said FOV and coplanar PLIB through a 3-D volume of space in which objects bearing bar code and/or other machine-readable indicia or graphical intelligence may pass.

Claim 277 (currently amended): A planar laser illumination and imaging module (PLIIM) for integration into a system having a working range, said PLIIM comprising:

a 2-D area-type electronic image detection array mounted on a common semiconductor substrate;

imaging optics with a field of view, mounted over said 2-D area-type electronic image detection array;

a 2-D array of surface emitting lasers (SELs) disposed about ~~a~~ said 2-D area-type ~~ELECTRONIC~~ electronic image detection array ~~on a common semiconductor substrate, with a field of view defining lens element mounted over the 2-D ELECTRONIC image detection array;~~ and

a 2-D array of cylindrical lens elements mounted over ~~the~~ said 2-D array of SELs;

wherein said plurality of substantially planar laser beam components are projected through said first and second elongated light transmission windows and produce a composite substantially planar laser illumination beam that has substantially planar spatial distribution characteristics that extend through said field of view projected through said third light transmission window, so that laser light reflected off an object illuminated by said composite substantially planar laser illumination beam is focused along said field of view and onto said image detecting array to form an image of said illuminated object; and

wherein said composite substantially planar laser illumination beam has substantially uniform power density characteristics over the spatial extent of said composite substantially planar laser illumination beam and thus over the working range of said system.